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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: <b>PCT/US95/15319</b></p> <p>(22) International Filing Date: <b>22 November 1995 (22.11.95)</b></p> <p>(30) Priority Data: 08/344,820 23 November 1994 (23.11.94) US</p> <p>(71) Applicant: <b>TERRAPIN TECHNOLOGIES, INC. [US/US]; 750-H Gateway Boulevard, South San Francisco, CA 94080 (US).</b></p> <p>(72) Inventors: <b>LYTTEL, Matthew, H.; P.O. Box 1116, Point Reyes Station, CA 94956 (US). KAUVAR, Lawrence, M.; 1205 Cole Street, San Francisco, CA 94117 (US).</b></p> <p>(74) Agents: <b>DROST, Patricia, M. et al.; Morrison &amp; Foerster, 2000 Pennsylvania Avenue, N.W., Washington, DC 20006 (US).</b></p>		
<p>(81) Designated States: AU, CA, JP, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p>Published <i>With international search report.</i></p> <p>(88) Date of publication of the international search report: <b>1 August 1996 (01.08.96)</b></p>		
<p>(54) Title: <b>CODON AMIDITES AND METHOD OF USING THEM TO PRODUCE OLIGONUCLEOTIDES AND MUTAGENESIS LIBRARIES</b></p> <p>(57) Abstract</p> <p>Compounds of formula (1) or (2) wherein W, X, Y and Z are each independently hydrogen or a protecting group; B<sup>1</sup>, B<sup>2</sup> and B<sup>3</sup> are each independently a base selected from the group consisting of adenine, guanine, cytosine, thymine and uracil; and    is the residue of a ribose or deoxyribose, and methods for their synthesis and use are disclosed.</p> <p> </p>		

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**INTERNATIONAL SEARCH REPORT**

International Application No  
PCT/US 95/15319

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 C07H21/00 C12N15/09 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 C07H C12N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO,A,93 21203 (THE JOHNS HOPKINS UNIVERSITY) 28 October 1993 see page 6 ---	1-3,6-11
P,X	NUCLEIC ACIDS RESEARCH, vol. 22, no. 25, 25 December 1994, OXFORD GB, pages 5600-5607, XP002002308 VIRENKAS B. ET AL: "Trinucleotide phosphoramidites: ideal reagents for the synthesis of mixed oligonucleotides for random mutagenesis" see the whole document ---	1-3,6-11 -/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search  14 May 1996	Date of mailing of the international search report  30.05.96
Name and mailing address of the ISA  European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl. Fax (+31-70) 340-3016	Authorized officer  Day, G

## INTERNATIONAL SEARCH REPORT

International Application No

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## C(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	BIOTECHNIQUES, vol. 19, no. 2, August 1995, NATICK US, pages 274-289, XP002002310 LYTTEL M.H. ET AL: "Mutagenesis using Trinucleotide beta-cyanoethyl phosphoramidites" see the whole document	1-11
X	JOURNAL OF ORGANIC CHEMISTRY, vol. 49, 1984, EASTON US, pages 4905-4912, XP002002311 KUMAR G ET AL: "Improvements in oligodeoxyribonucleotide synthesis: methyl N,N-dialkylphosphoramidite dimer units for solid support phosphite methodology" cited in the application see page 4907	4,5
A	WO,A,92 03461 (IXSYS INC) 5 March 1992 see the whole document	9-11
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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 95/15319

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO-A-9321203	28-10-93	CA-A-	2133554	28-10-93
		EP-A-	0638089	15-02-95
		JP-T-	8502642	26-03-96
WO-A-9203461	05-03-92	AU-B-	8505191	17-03-92
		CA-A-	2089362	25-02-92
		EP-A-	0544809	09-06-93
		JP-T-	6503809	28-04-94
		US-A-	5264563	23-11-93